## AMENDMENTS TO THE CLAIMS

This listing of Claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims**

1. (Currently Amended) A method for multiplex primer-based amplification of a target sequence from a plurality of agents, said target sequence being different for each agent, said method comprising:
   a. carrying out a first amplification reaction for each target sequence to be amplified using
      i) as a template, a nucleic acid from each of said plurality of agents, said nucleic acid containing said target sequence;
      ii) a first pair of target enrichment primers hybridizing to said nucleic acid and bracketing said target sequence;
      iii) a second pair of target enrichment primers hybridizing to said nucleic acid and bracketing said target sequence, said second pair of target enrichment primers being located proximate to said target sequence and one of the second pair of target enrichment primers comprising at its 5' end a binding tag corresponding to the sequence of one of a pair of target amplification primers and the other of the second pair of target enrichment primers comprising at its 5' end a binding tag corresponding to the sequence of the other of said pair of target amplification primers, wherein the second pair of target enrichment primers binds to the inside of the first set of target enrichment primers; and
      iv) amplification reagents and conditions for said first amplification reaction such that the first amplification reaction generates a plurality of first amplification products, wherein at least a portion of the first amplification products contain said target sequence and at least one complement of the binding tag for one of said target enrichment primers thereby forming at least one binding site for at

least one of said target amplification primers; and

b. carrying out a second amplification reaction for each target sequence to be amplified using

i) as a template, said portion of the first amplification products containing said at least one binding site for at least one of said target amplification primers;

ii) at least one of said first pair of target amplification primers binding to its corresponding binding sites on said portion of said first amplification products; and

iii) amplification reagents and conditions for said second amplification reaction such that the second amplification reaction generates a plurality of second amplification products containing the target sequence.

2. (Currently Amended) The method of claim 1 where said first pair of target enrichment primers comprises a reverse outer ($R_o$) and a forward outer ($F_o$) primer, said second pair of target enrichment primers comprises a forward inner ($F_i$) and a reverse inner ($R_i$) primer and said first pair of target amplification primers comprises a forward super primer (FSP) and a reverse super primer (RSP).

3. (Previously Presented) The method of claim 2 where said binding tag on $F_i$ is identical to the sequence of the FSP such that the FSP binds the complement of the binding tag on said $F_i$ primer and the binding tag on $R_i$ is identical to the sequence of the RSP such that the RSP binds the complement of the binding tag on said $R_i$ primer.

4. (Original) The method of claim 1 where the length of each of the first pair of target enrichment primers is selected from the group consisting of: 10-40 nucleotides, 10-30 nucleotides and 10-20 nucleotides.

5. (Original) The method of claim 1 where the length of each of the second pair of target enrichment primers is selected from the group consisting of: 10-40 nucleotides, 10-30 nucleotides and 10-20 nucleotides.

6. (Original) The method of claim 1 where the length of each of the first pair of target enrichment primers is 10-20 nucleotides and the length of each of the second pair of target enrichment primers is 30 to 40 nucleotides.

7. (Original) The method of claim 1 where the length of each of the first pair of target

amplification primers is 10-20 nucleotides and the length of each of the second pair of target enrichment primers is 30 to 40 nucleotides.

8. (Original) The method of claim 1 where the target enrichment primers are present at a low concentration and the target amplification primers are present at a high concentration.
9. (Original) The method of claim 8 where said low concentration is a concentration of 0.002 μM to 0.2 μM and said high concentration is a concentration of 0.2 μM to 1.0 μM.
10. (Original) The method of claim 1 where the target enrichment primers are present at a concentration that is not sufficient for exponential amplification of the target sequence and the target amplification primers are present at a concentration that is sufficient for exponential amplification of the target sequence.
11. (Withdrawn) The method of claim 1 where each of the target enrichment primers is used at the same concentration.
12. (Original) The method of claim 1 where at least one of the target enrichment primers is used at a higher concentration than the other target enrichment primers.
13. (Withdrawn) The method of claim 1 where each of the target amplification primers is used at the same concentration.
14. (Original) The method of claim 1 where at least one of the target amplification primers is used at a higher concentration than the other target amplification primer.
15. (Original) The method of claim 14 where said target amplification primer at said higher concentration comprises a means for detection.
16. (Previously Presented) The method of claim 1 where the conditions for said first amplification reaction comprise at least two complete cycles of a target enrichment process and the conditions for said second amplification reaction comprise at least two complete cycles of a target amplification process.
17. (Original) The method of claim 16 where the target enrichment process comprises the following conditions for amplification: 0.5 to 1 minute at 92-94$^0$C, 1-2.5 minutes at 50-55$^0$C and 0.5 to 1 minute at 70-72$^0$C and the target amplification process comprises the following conditions for amplification: 15 to 30 seconds at 94$^0$C, 15 to 30 seconds at 50-55$^0$C and 15 to 30 second at 72$^0$C.

18. (Previously Presented) The method of claim 1 where the conditions for said first amplification reaction comprise at least two complete cycles of a target enrichment process and at least two complete cycles of a selective amplification process and the conditions for said second amplification reaction comprise at least two complete cycles of a target amplification process.
19. (Original) The method of claim 18 where the target enrichment process comprises the following conditions for amplification: 0.5 to 1 minute at 92-94$^0$C, 1-2.5 minutes at 50-55$^0$C and 0.5 to 1 minute at 70-72$^0$C, the selective amplification process comprises the following conditions for amplification: 15 to 30 seconds at 92-94$^0$C, 1 to 2 minutes at 70-72$^0$C and the target amplification process comprises the following conditions for amplification: 15 to 30 seconds at 94$^0$C, 15 to 30 seconds at 50-55$^0$C and 15 to 30 second at 72$^0$C.
20. (Previously Presented) The method of claim 19 where the selective amplification is biased toward the production of first amplification products containing the binding site for at least one of said target amplification primers.
21. (Original) The method of claim 19 where the length of each of the first pair of target enrichment primers is 10-20 nucleotides and the length of each of the second pair of target enrichment primers is 30 to 40 nucleotides.
22. (Previously Presented) The method of claim 1 further comprising three or more pairs of target enrichment primers.
23. (Previously Presented) The method of claim 1 further comprising two or more pairs of target amplification primers.
24. (Previously Presented) The method of claim 1 where said agent is selected from the group consisting of: a virus and a bacteria.
25. (Previously Presented) The method of claim 24 where said virus is selected from the group consisting of: adenovirus, influenza A, influenza B, parainfluenza type 1, parainfluenza type 3, and respiratory syncytial virus, SARS, enterovirus, rhinovirus, and echovirus.
26. (Withdrawn) The method of claim 24 where said bacteria is selected from the group consisting of: *Mycoplasma* species and *Chlamydia* species.
27. (Previously Presented) The method of claim 24 where said agent is selected by the

appropriate design of the first and second pair of target enrichment primers.

28. (Previously Presented) The method of claim 1 where at least one of said target amplification primers further comprises a means for detection.
29. (Previously Presented) The method of claim 28 where said means for detection is selected from the group consisting of: a chemical element, an enzymatic element, a fluorescent element, or a radiolabel element.
30. (Original) The method of claim 1 further comprising detecting said target sequence.
31. (Original) The method of claim 30 where the detection method is a direct detection method.
32. (Previously Presented) The method of claim 30 where said detection method comprises:
    a. providing a detection oligonucleotide for each target sequence to be detected, each detection oligonucleotide comprising a first means for signal generation;
    b. contacting and incubating said detection oligonucleotide with said second amplification products;
    c. stimulating said first means for signal generation to produce a first signal; and
    d. detecting said first signal.
33. (Previously Presented) The method of claim 32 where said first signal is unique for each target sequence to be detected and said first signal is used to identify said agent.
34. (Original) The method of claim 32 where said means for first signal generation is a fluorescent label, a chemical label, an enzymatic label, or a radiolabel.
35. (Original) The method of claim 32 where said means for first signal generation is a fluorescent microsphere.
36. (Withdrawn) The method of claim 30 where said method is an indirect detection method.
37. (Cancelled)

38-68 (Cancelled)

69. (Withdrawn) A method of diagnosing the presence of a disease agent in a subject, said method comprising:
    a. providing a sample from said subject in need of said diagnosis, said sample

suspected of containing said disease agent;

b. isolating a nucleic acid from said sample, said nucleic acid containing a target sequence from said disease agent;

c. subjecting said nucleic acid to the primer-based amplification method of claim 1 or 37;

d. detecting said target sequence from said disease agent.

70-78 (Cancelled)

79. (Withdrawn) A method for differentially diagnosing the presence of a disease agent and a secondary disease agent in a subject, said method comprising:

a. providing a sample from said subject in need of said diagnosis, said sample suspected of containing said disease agent or said secondary disease agent;

b. isolating a nucleic acid from said sample, said nucleic acid containing a target sequence from said disease agent or secondary disease agent or both;

c. subjecting said nucleic acid to the primer-based amplification method claim 1 or 37;

d. detecting said target sequence from said disease agent or secondary disease agent or both.

80-88 (Cancelled)

89. (Previously Presented) The method of claim 25 where said enterovirus is selected from the group consisting of: coxsackie virus A and coxsackie virus B.